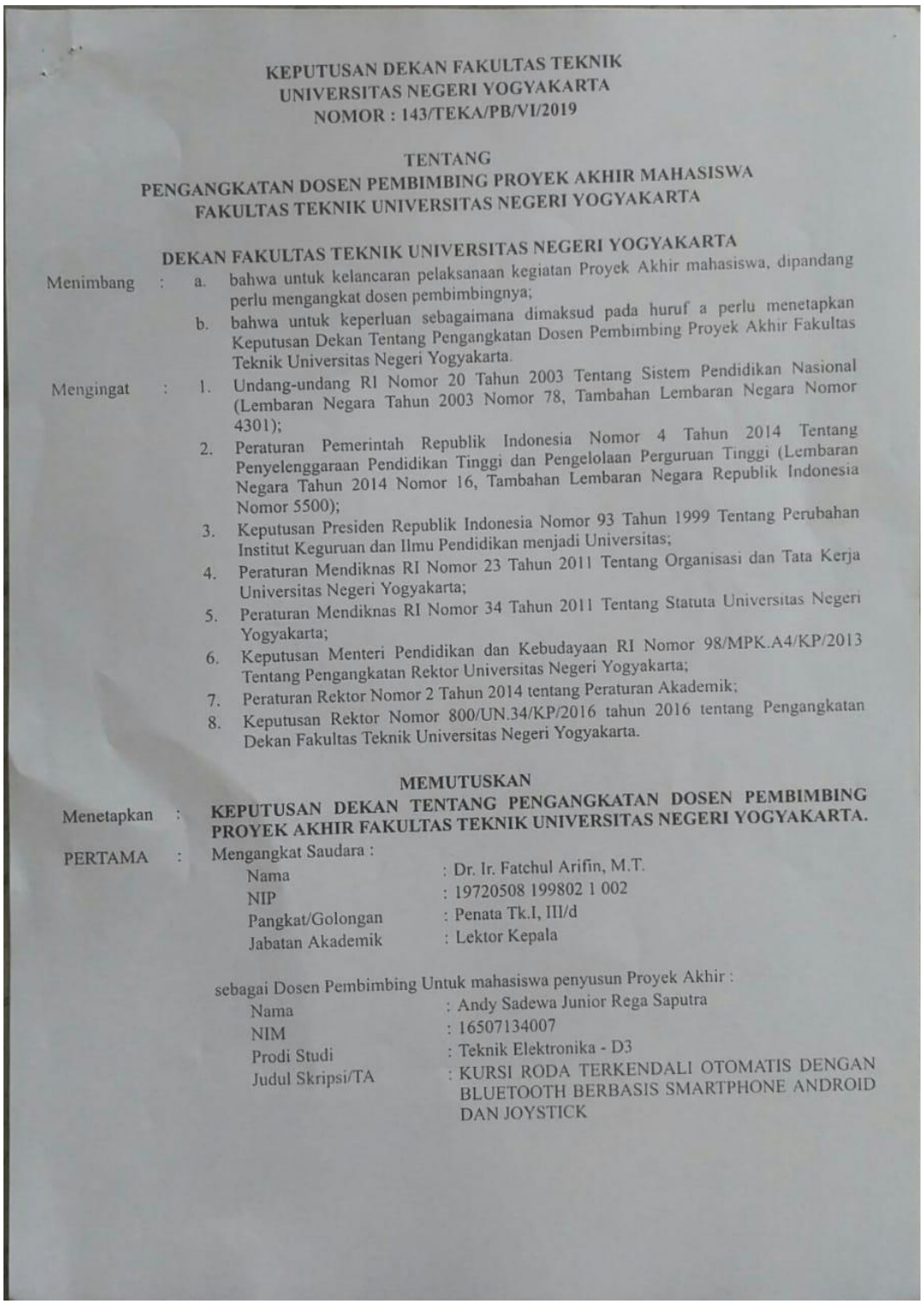
LAMPIRAN-LAMPIRAN

Lampiran 1. SK Bimbingan



KEPUTUSAN DEKAN FAKULTAS TEKNIK
UNIVERSITAS NEGERI YOGYAKARTA
NOMOR : 143/TEKA/PB/VI/2019

TENTANG
PENGANGKATAN DOSEN PEMBIMBING PROYEK AKHIR MAHASISWA
FAKULTAS TEKNIK UNIVERSITAS NEGERI YOGYAKARTA

DEKAN FAKULTAS TEKNIK UNIVERSITAS NEGERI YOGYAKARTA

Menimbang :
a. bahwa untuk kelancaran pelaksanaan kegiatan Proyek Akhir mahasiswa, dipandang perlu mengangkat dosen pembimbingnya;
b. bahwa untuk keperluan sebagaimana dimaksud pada huruf a perlu menetapkan Keputusan Dekan Tentang Pengangkatan Dosen Pembimbing Proyek Akhir Fakultas Teknik Universitas Negeri Yogyakarta.

Mengingat :
1. Undang-undang RI Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional (Lembaran Negara Tahun 2003 Nomor 78, Tambahan Lembaran Negara Nomor 4301);
2. Peraturan Pemerintah Republik Indonesia Nomor 4 Tahun 2014 Tentang Penyelenggaraan Pendidikan Tinggi dan Pengelolaan Perguruan Tinggi (Lembaran Negara Tahun 2014 Nomor 16, Tambahan Lembaran Negara Republik Indonesia Nomor 5500);
3. Keputusan Presiden Republik Indonesia Nomor 93 Tahun 1999 Tentang Perubahan Institut Keguruan dan Ilmu Pendidikan menjadi Universitas;
4. Peraturan Mendiknas RI Nomor 23 Tahun 2011 Tentang Organisasi dan Tata Kerja Universitas Negeri Yogyakarta;
5. Peraturan Mendiknas RI Nomor 34 Tahun 2011 Tentang Statuta Universitas Negeri Yogyakarta;
6. Keputusan Menteri Pendidikan dan Kebudayaan RI Nomor 98/MPK.A4/KP/2013 Tentang Pengangkatan Rektor Universitas Negeri Yogyakarta;
7. Peraturan Rektor Nomor 2 Tahun 2014 tentang Peraturan Akademik;
8. Keputusan Rektor Nomor 800/UN.34/KP/2016 tahun 2016 tentang Pengangkatan Dekan Fakultas Teknik Universitas Negeri Yogyakarta.

MEMUTUSKAN

Menetapkan : **KEPUTUSAN DEKAN TENTANG PENGANGKATAN DOSEN PEMBIMBING PROYEK AKHIR FAKULTAS TEKNIK UNIVERSITAS NEGERI YOGYAKARTA.**

PERTAMA : Mengangkat Saudara :

Nama	: Dr. Ir. Fatchul Arifin, M.T.
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Jabatan Akademik	: Lektor Kepala

sebagai Dosen Pembimbing Untuk mahasiswa penyusun Proyek Akhir :

Nama	: Andy Sadewa Junior Rega Saputra
NIM	: 16507134007
Prodi Studi	: Teknik Elektronika - D3
Judul Skripsi/TA	: KURSI RODA TERKENDALI OTOMATIS DENGAN BLUETOOTH BERBASIS SMARTPHONE ANDROID DAN JOYSTICK

Lampiran 2. *Source Code*

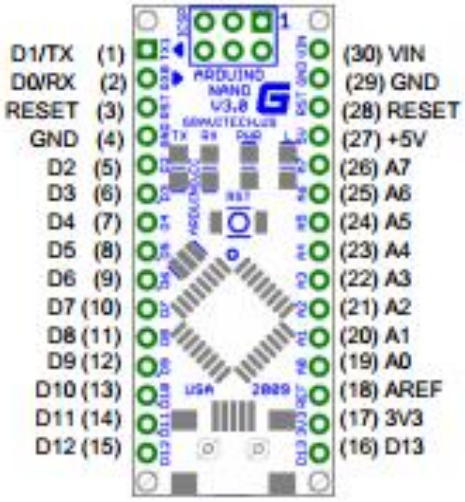
```
#include <Arduino.h>


const int modePin = 2;
const int x = A0;
const int y = A1;
int xa;
int ya;
long period = 50;
long period1 = 50;
long time_now = 0;
long time_now1 = 0;
int modeState = 0;
int motorSpeed = 0;
char data = 0;


void maju(){
  motorSpeed = map(xa, 550, 1023, 0, 255);
  analogWrite(5, motorSpeed);
  analogWrite(6, motorSpeed);
}
void mundur(){
  motorSpeed = map(xa, 470, 0, 0, 255);
  analogWrite(3, motorSpeed);
  analogWrite(9, motorSpeed);
}
void kiri(){
  motorSpeed = map(ya, 470, 0, 0, 255);
  analogWrite(3, motorSpeed);
 analogWrite(6, motorSpeed);
}
void kanan(){
  motorSpeed = map(ya, 550, 1023, 0, 255);
  analogWrite(5, motorSpeed);
  analogWrite(9, motorSpeed);
```

```
void diam(){
  analogWrite(3, 0);
  analogWrite(5, 0);
  analogWrite(6, 0);
  analogWrite(9, 0);
}
void kontrolJoys(){
  if(modeState == HIGH){
    xa = analogRead(x);
    ya = analogRead(y);
    if (ya > 450 && ya < 550){
      diam();
    }
    if (xa > 550 && ya >= 470 && ya <= 550){
      maju();
    }
    if (xa < 470 && ya >= 470 && ya <= 550){
      mundur();
    }
    if (ya < 470 && xa >= 470 && xa <= 550){
      kiri();
    }
    if (ya > 550 && xa >= 470 && xa <= 550){
      kanan();
    }
  }
}
void kontrolBT(){
  if(modeState == LOW){
    if(Serial.available() > 0){
      data = Serial.read();
      Serial.print("Data BT = ");
      Serial.println(data);
      if(data == '1') {
```

```
  maju();
     }
     else if(data == '2') {
       mundur();
     }
     else if(data == '3') {
       kiri();
     }
     else if(data == '4') {
       kanan();
     }
     else if(data == '0') {
       diam();
     }
    }
  }
}
void setup(){
  Serial.begin(9600);
  pinMode(3, OUTPUT);
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(modePin, INPUT);
}
void loop(){
  modeState = digitalRead(modePin);
  if(millis() - time_now > period){
    time_now = millis();
    kontrolJoys();
  }
  if(millis() - time_now1 > period1){
    time_now1 = millis();
    kontrolBT();
```

Lampiran 3. Datasheet Arduino Nano

Arduino Nano Pin Layout



Pin No.	Name	Type	Description
1-2, 5-16	D0-D13	I/O	Digital input/output port 0 to 13
3, 28	RESET	Input	Reset (active low)
4, 29	GND	PWR	Supply ground
17	3V3	Output	+3.3V output (from FTDI)
18	AREF	Input	ADC reference
19-26	A0-A7	Input	Analog input channel 0 to 7
27	+5V	Output or Input	+5V output (from on-board regulator) or +5V (input from external power supply)
30	VIN	PWR	Supply voltage

2

Schematic and Design

Arduino Nano 3.0 (ATmega328): **schematic**, **Eagle files**.
Arduino Nano 2.3 (ATmega168): **manual** (pdf), **Eagle files**. *Note:* since the free version of Eagle does not handle more than 2 layers, and this version of the Nano is 4 layers, it is published here unrouted, so users can open and use it in the free version of Eagle.

Specifications:

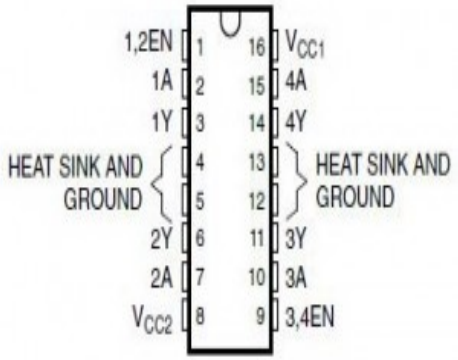
Microcontroller	Atmel ATmega168 or ATmega328
Operating Voltage (logic level)	5 V
Input Voltage (recommended)	7-12 V
Input Voltage (limits)	6-20 V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	8
DC Current per I/O Pin	40 mA
Flash Memory	16 KB (ATmega168) or 32 KB (ATmega328) of which 2 KB used by bootloader
SRAM	1 KB (ATmega168) or 2 KB (ATmega328)
EEPROM	512 bytes (ATmega168) or 1 KB (ATmega328)
Clock Speed	16 MHz
Dimensions	0.73" x 1.70"

Power:

The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is automatically selected to the highest voltage source.

Lampiran 4. Datasheet IC L293D

Konstruksi Pin Driver Motor DC IC L293D



Fungsi Pin Driver Motor DC IC L293D

- Pin EN (Enable, EN1.2, EN3.4) berfungsi untuk mengijinkan driver menerima perintah untuk menggerakan motor DC.
- Pin In (Input, 1A, 2A, 3A, 4A) adalah pin input sinyal kendali motor DC
- Pin Out (Output, 1Y, 2Y, 3Y, 4Y) adalah jalur output masing-masing driver yang dihubungkan ke motor DC
- Pin VCC (VCC1, VCC2) adalah jalur input tegangan sumber driver motor DC, dimana VCC1 adalah jalur input sumber tegangan rangkaian kontrol dirver dan VCC2 adalah jalur input sumber tegangan untuk motor DC yang dikendalikan.
- Pin GND (Ground) adalah jalu yang harus dihubungkan ke ground, pin GND ini ada 4 buah yang berdekatan dan dapat dihubungkan ke sebuah pendingin kecil.

Lampiran 5. Datasheet *Joystick*

Pin Configuration

Pin No.	Pin Name	Description
1	Gnd	Ground terminal of Module
2	+5v	Positive supply terminal of Module
3	VRx	Voltage Proportional to X axis
4	VRy	Voltage Proportional to Y axis
5	SW	Switch

Features

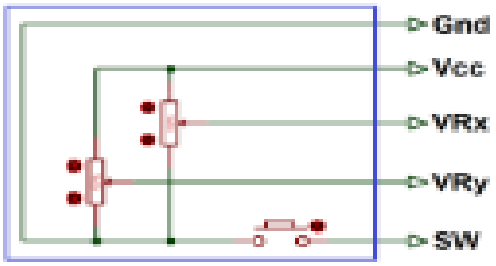
- Two independent Potentiometer: one for each axis (X and Y)
- Auto return to center position
- Low weight
- Cup-type Knob
- Compatible to interface with Arduino or with most microcontrollers

Technical Specifications

- Operating Voltage: 5V
- Internal Potentiometer value: 10k
- 2.54mm pin interface leads
- Dimensions: 1.57 in x 1.02 in x 1.26 in (4.0 cm x 2.6 cm x 3.2 cm)
- Operating temperature: 0 to 70 °C

Internal Structure

The below image is the **internal diagram of a joystick Module**. It consists of two Potentiometer, each for one axis (X and Y). Both 10k potentiometer are independent to move in their particular direction. SW (Switch) pin is connected to a push button internally.

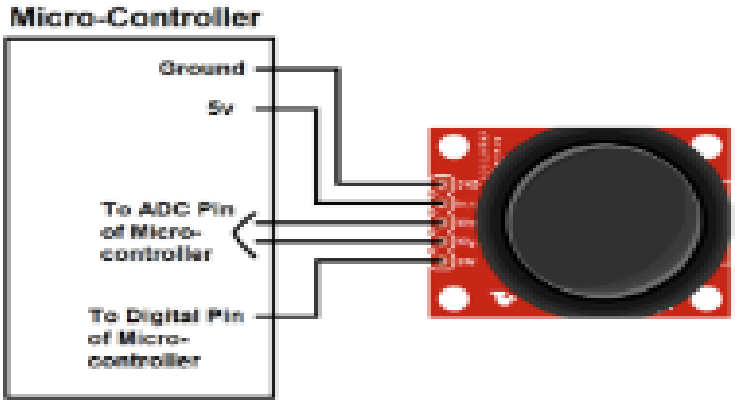


Where Joysticks Are Used?

When we listen the word "**Joystick**" we think of Game controllers. If we talk about Electronics there are many useful application of joystick. These type of module are mostly used in Arduino based DIY projects and Robot Control. As we know, the module gives analog output so it can be used for feeding the analog input based on direction or movement. It can also be connected to a movable camera to control its movement.

How to Use Joystick?

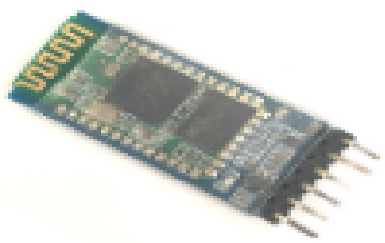
We can use a joystick Module with Arduino, Raspberry Pi and any other Micro-controllers. We just have to connect the axis Pins VRx and VRy to the ADC Pins of the micro-controller. If you want to use the switch then connect it to the digital Pin of the Micro-controller. Follow the below block diagram to connect Joystick Module with Microcontroller.



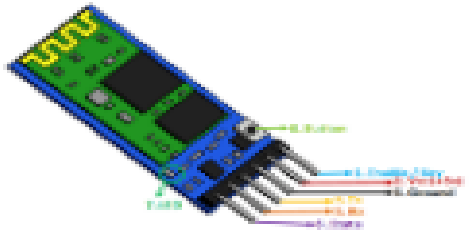
Lampiran 6. Datasheet Bluetooth HC-05

HC-05 - Bluetooth Module

10 March 2018 - 0 Comments



HC-05 Bluetooth Module



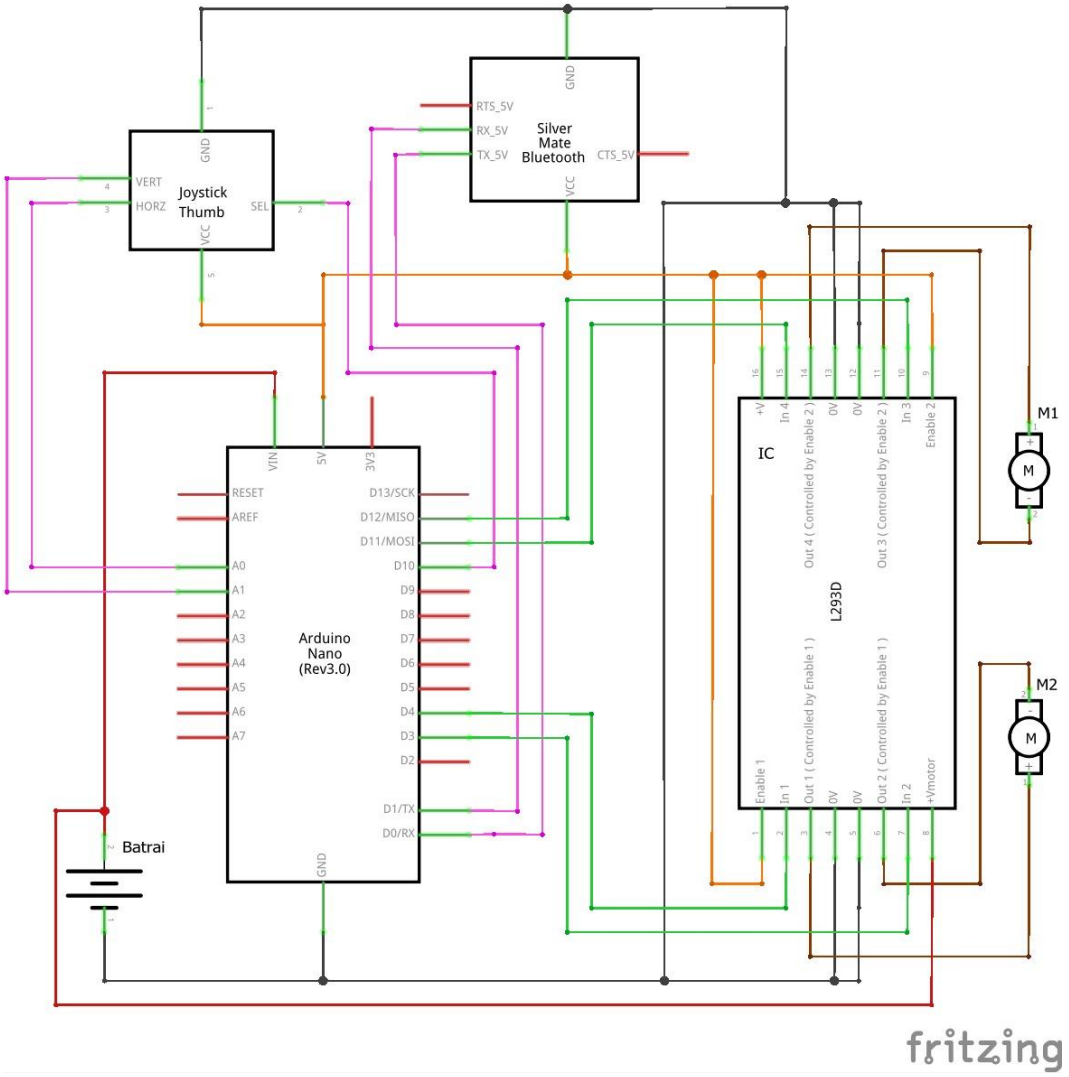
HC-05 Bluetooth Module Pinout

[Click the image to enlarge it]

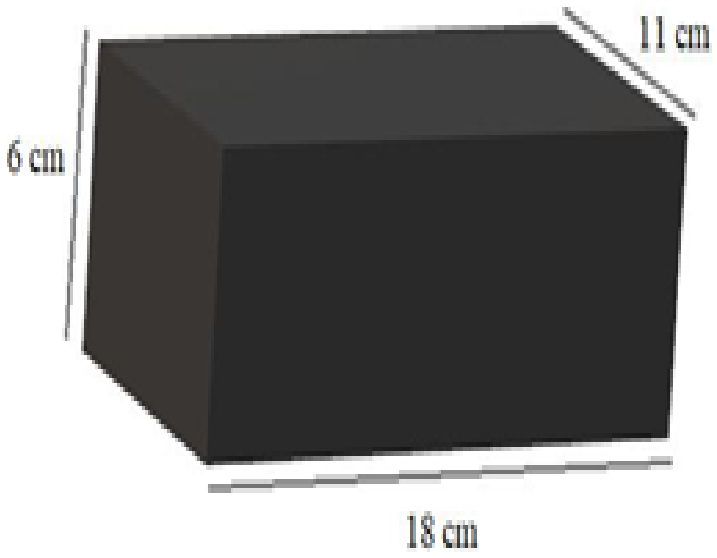
Pin Configuration

Pin Number	Pin Name	Description
1	Enable / Key	This pin is used to toggle between Data Mode (set low) and AT command mode (set high). By default it is in Data mode
2	Vcc	Powers the module. Connect to +5V Supply voltage
3	Ground	Ground pin of module, connect to system ground.
4	TX – Transmitter	Transmits Serial Data. Everything received via Bluetooth will be given out by this pin as serial data.
5	RX – Receiver	Receive Serial Data. Every serial data given to this pin will be broadcasted via Bluetooth
6	State	The state pin is connected to on board LED, it can be used as a feedback to check if Bluetooth is working properly.
7	LED	Indicates the status of Module • Blink once in 2 sec: Module has entered Command Mode • Repeated Blinking: Waiting for connection in Data Mode • Blink twice in 1 sec: Connection successful in Data Mode
8	Button	Used to control the Key/Enable pin to toggle between Data and command Mode

Lampiran 7. Rangkaian Sistem



Lampiran 8. Desain Simulator Kursi Roda dan *Blackbox*



Lampiran 9. Foto Simulator Kursi Roda